



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/501,240

03/30/2005

Theodorus Johannes Brok

TS1175US

5321

23632 7590 03/13/2008  
SHELL OIL COMPANY  
P O BOX 2463  
HOUSTON, TX 772522463

EXAMINER

WU, IVES J

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

03/13/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |                                    |  |
|------------------------------|--------------------------------------|------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/501,240 | <b>Applicant(s)</b><br>BROK ET AL. |  |
|                              | <b>Examiner</b><br>IVES WU           | <b>Art Unit</b><br>1797            |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4,9,12-16,20,23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4,9,12-16, 20, 23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

- (1). Applicants' Amendments and Remarks filed on 01/07/2008 have been received. Claims 1, 3-4, 9, 12, 14-15 and 20 are amended. Claims 5-8, 10-11 and 17-19 and 21-22 are cancelled. New claim 23 is added. Consequently, the 112 2<sup>nd</sup> rejection of claim 14 and rejections of claims 1-22 in prior Office Action dated 11/15/2007 is withdrawn in response to the current Amendments, Remarks. However, a new ground of rejections for claims 1-4, 9, 12-16 and 20, 23 is introduced hereinafter.

#### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

- (2). **Claims 1-4, 9, 12-16, 20 and 23** are rejected under 35 U.S.C. 102(b) as being anticipated by Wagner et al (US04997630).

As to 15 to 40 parts by weight sulfolane and between 30 to 60 parts by weight of an amine selected from the group of amines consisting of MEA, DEA, TEA, DIPA and MDEA, wherein the parts by weight to be based on the amounts of water, sulfolane and amine together being 100 parts by weight in an aqueous washing solution in a process for removal of carbon dioxide from a gas stream containing carbon dioxide in **independent claim 1**, Wagner et al (US04997630) disclose a process for the removal of CO<sub>2</sub> and/or H<sub>2</sub>S from gases by means of an aqueous methyldiethanolamine-containing absorption liquid (Col. 1, line 8-11). The solvent used for the process to be an aqueous absorption liquid containing from 20 to 70 preferably from 30 to 65, and in particular from 40 to 60 wt% of methyldiethanolamine (Col. 2, line 29-32). The aqueous absorption liquid containing from 20 to 70 wt% methyldiethanolamine can additionally contain a physical solvent. Examples of suitable physical solvents are N-methylpyrrolidone, tetramethylene sulfone (**sulfolane**). The physical solvent is present in the absorption liquid in general in an amount of from 1 to 60, preferably from 10 to 50, in particular from 20 to 40 wt% (Col. 2, line 44-54).

As to 15 to 45 parts by weight of water in an aqueous washing solution in a process for removal of carbon dioxide from a gas stream containing carbon dioxide in **independent claim 1**, the balance of aqueous washing liquid of Wagner et al (US04997630) would be water, which reads on the limitation as claimed.

As to aqueous washing solution containing piperazine in an amount in the range of from 0.7 mol/l to 0.9 mol/l in **independent claim 1**, Wagner et al (US04997630) disclose, advantageously, the aqueous methyldiethanolamine solution used additionally contains from 0.05 to 1, in particular from 0.1 to 0.8, and especially from 0.1 to 0.6 mol/l of very particularly advantageously piperazine (Col. 2, line 35-43).

As to gas stream being natural gas or synthesis gas in **claim 2**, Wagner et al (US04997630) disclose examples of gases treated by the novel process being coal gasification gases, coke oven gases, natural gases and synthetic gases (Col. 2, line 19-21).

As to gas stream including an amount of carbon dioxide to be between 1 and 45 mol%, an amount of hydrogen sulphide to be between 0 and 25 mol%, and an amount of COS to be between 0 and 2 mol% in **claim 3**, Wagner et al (US04997630) disclose, the gases having a CO<sub>2</sub> content of in general from 1 to 90, preferably from 2 to 90, and in particular from 5 to 60 mol%. In addition to the CO<sub>2</sub>, the gases can contain H<sub>2</sub>S as a further acidic gas, or can contain H<sub>2</sub>S alone (Col. 2, line 22-28). In any event, the amount of COS and H<sub>2</sub>S can be zero.

As to aqueous washing solution including an amount of water between 20 to 45 parts by wt, an amount of sulfolane between 20 to 35 parts by wt, and an amount of amine between 40 to 55 parts by wt, wherein the parts by weights are based on the amounts of water, sulfolane and amine together being 100 parts by weight in **claim 4**, the disclosure of Wagner et al is incorporated herein by reference, the most subject matters as currently claimed, have been recited in applicants' claim 1, and have been discussed therein.

As to piperazine being in aqueous washing solution in amount in the range of from 0.6 to 0.8 mol/l in **claim 9**, the disclosure of Wagner et al is incorporated herein by reference, the most subject matter as currently claimed, have been recited in applicants' claim 1, and have been discussed therein.

As to process being carried out at a temperature of at least 20 °C in **claim 12**, Wagner et al (US04997630) disclose the 1<sup>st</sup> absorption stage at from 40 to 100° C (Abstract).

As to process also comprising a regeneration of the loaded solvent in **claim 13**, Wagner et al (US04997630) disclose the laden absorption liquid obtained from 1<sup>st</sup> absorption stage to be regenerated by being let down in not less than 2 flash stages (Col. 3, line 32-53).

As to process to be carried out at a pressure between 25 to 90 bara in **claim 14**, Wagner et al (US04997630) disclose, in general, pressure of from 5 to 110, preferably from 10 to 100, in particular from 20 to 90 bar are employed in the 1<sup>st</sup> and 2<sup>nd</sup> absorption stages, and pressures in these two stages may differ from one another (Col. 3, line 16-20).

As to the composition in an absorbent liquid in **independent claim 15**, the disclosure of Wagner et al is incorporated herein by reference, the most subject matters as currently claimed, have been recited in applicants' claim 1, and have been discussed therein.

As to absorbent liquid including an amount of water between 20 to 45 parts by wt, an amount of sulfolane between 20 to 35 parts by wt, and an amount of amine between 40 to 55 parts by wt, wherein the parts by weights are based on the amounts of water, sulfolane and amine together being 100 parts by weight in **claim 16**, the disclosure of Wagner et al is incorporated herein by reference, the most subject matters as currently claimed, have been recited in applicants' claim 4, and have been discussed therein.

As to absorbent liquid having piperazine in an amount in the range of from 0.6 to 0.8 mol/l in **claim 20**, the disclosure of Wagner et al is incorporated herein by reference, the most subject matter as currently claimed, have been recited in applicants' claim 9, and have been discussed therein.

As to amine to be MDEA in **claim 23**, Wagner et al (US04997630) disclose an aqueous absorption liquid containing from 20 to 79 wt% of methyldiethanolamine (MDEA) (Abstract).

### ***Response to Arguments***

Applicant's arguments, see page 5 and 6 in present Remarks, filed on 01/07/2008, with respect to the rejection(s) of claim(s) 1-22 under 102 and 103 by Schubert et al (US06337059B1) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Wagner et al (US04997630).

Art Unit: 1797

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IVES WU whose telephone number is (571)272-4245. The examiner can normally be reached on 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner: Ives Wu

Art Unit: 1797

Date: March 3, 2008

/Duane S. Smith/  
Supervisory Patent Examiner  
Art Unit 1797  
3-4-08